

[illegible]

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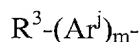
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8. A compound of claim 1, wherein R^1 and R^2 are each independently substituents having the formula:

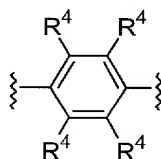


wherein

the subscript m is an integer of from 1 to 5;

each Ar^j is selected from the group consisting of

a) a 1,4-phenylene group having the formula:



wherein each R^4 is a member independently selected from the group consisting of

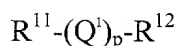
H, substituted or unsubstituted (C_1 - C_{12})alkyl, substituted or unsubstituted (C_1 - C_{12})alkoxy, substituted or unsubstituted (C_1 - C_{12})alkylamino, substituted or unsubstituted (C_1 - C_{12})alkylthio, substituted or unsubstituted di(C_1 - C_{12})alkylamino, substituted or unsubstituted arylamino, substituted or unsubstituted diarylamino and halogen, with the proviso that at least two of the four R^4 substituents are independently selected from substituted or unsubstituted (C_1 - C_{12})alkyl and substituted or unsubstituted (C_1 - C_{12})alkoxy, and

b) an aryl biradical selected from the group consisting of 1,4-naphthylene, 1,4-anthrylene, 9,10-anthrylene, 5,6,7,8-tetrahydronaphth-1,4-ylene, 9,9',10,10'-tetra(C_1 - C_{12})alkyl-9,10-dihydroanthr-1,4-ylene, 9,9'10,10'-tetraaryl-9,10-dihydroanthr-1,4-ylene, 9,9'10,10'-tetra(C_1 - C_{12})alkyl-9,10-dihydroanthr-2,6-ylene, 9,9'10,10'-tetraaryl-9,10-dihydroanthr-1,4-ylene; and

R^3 is selected from the group consisting of H, substituted or unsubstituted (C_1 - C_{12})alkyl, substituted or unsubstituted (C_1 - C_{12})alkoxy, substituted or unsubstituted (C_1 - C_{12})alkylamino, substituted or unsubstituted (C_1 - C_{12})alkylthio, substituted or unsubstituted di(C_1 - C_{12})alkylamino, substituted or unsubstituted arylamino, substituted or unsubstituted diarylamino and halogen.

9. A compound of claim 8, wherein m is an integer of from 1 to 3.

10. A polymer of the formula:



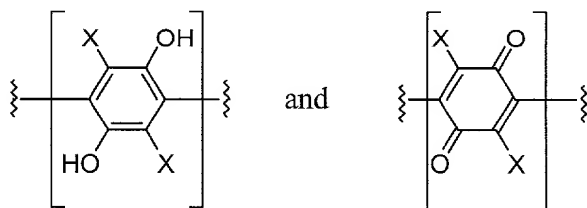
wherein

each R^{11} and R^{12} is independently selected from the group consisting of H, substituted or unsubstituted (C_1-C_{12}) alkyl, substituted or unsubstituted (C_1-C_{12}) alkoxy, substituted or unsubstituted (C_1-C_{12}) alkylamino, substituted or unsubstituted (C_1-C_{12}) alkylthio, substituted or unsubstituted di (C_1-C_{12}) alkylamino, substituted or unsubstituted arylamino, substituted or unsubstituted diarylamino and halogen;

the subscript p is an integer of from 5 to 200;

the superscript i is an integer of from 1 to p and indicates the position downstream from R^1 of each Q;

each Q^i is a benzoquinone or hydroquinone subunit selected from the formulae:



wherein

each X is independently selected from the group consisting of H, substituted or unsubstituted (C_1-C_{12}) alkyl, substituted or unsubstituted (C_1-C_{12}) alkoxy, substituted or unsubstituted (C_1-C_{12}) alkylamino, substituted or unsubstituted (C_1-C_{12}) alkylthio, substituted or unsubstituted di (C_1-C_{12}) alkylamino, substituted or unsubstituted arylamino, substituted or unsubstituted diarylamino and halogen.

11. A polymer of claim 10, wherein said hydroquinone and benzoquinone subunits are present in about a 50:50 ratio.

12. A polymer of claim 10, wherein said hydroquinone and benzoquinone subunits alternate in said polymer so that no two hydroquinone subunits are adjacent and no two benzoquinone subunits are adjacent.

13. A polymer of claim 10, wherein two adjacent hydroquinone subunits alternate with one benzoquinone subunit.

14. A polymer of claim 10, wherein two adjacent benzoquinone subunits alternate with one hydroquinone subunit.

15. A block copolymer having the formula:



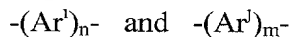
wherein

each R^{21} and R^{22} is independently selected from the group consisting of H, substituted or unsubstituted (C_1-C_{12}) alkyl, substituted or unsubstituted (C_1-C_{12}) alkoxy, substituted or unsubstituted (C_1-C_{12}) alkylamino, substituted or unsubstituted (C_1-C_{12}) alkylthio, substituted or unsubstituted di (C_1-C_{12}) alkylamino, substituted or unsubstituted arylamino, substituted or unsubstituted diarylamino and halogen;

the subscript k is an integer of from 2 to 20;

the superscript j is an integer of from 1 to k and indicates the position downstream from R^{21} of each Q;

each Q^j is a para-phenylene block subunit or a solubility-enhancing subunit, said subunits selected from the formulae:



wherein

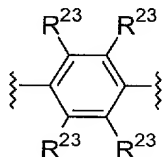
the subscript n is an integer of from 5 to 15;

the subscript m is an integer of from 1 to 5;

each Ar^l is a substituted or unsubstituted aryl group linked in a manner that maintains a coplanar orientation relative to adjacent Ar^l groups;

each Ar^l is selected from the group consisting of

a) a 1,4-phenylene group having the formula:



wherein each R^{23} is a member independently selected from the group consisting of

H, substituted or unsubstituted (C_1-C_{12}) alkyl, substituted or unsubstituted (C_1-C_{12}) alkoxy, substituted or unsubstituted (C_1-C_{12}) alkylamino, substituted or unsubstituted (C_1-C_{12}) alkylthio, substituted or unsubstituted di (C_1-C_{12}) alkylamino, substituted or unsubstituted arylamino, substituted or

unsubstituted diarylamino and halogen, with the proviso that at least two of the four R²³ substituents are independently selected from substituted or unsubstituted (C₁-C₁₂)alkyl and substituted or unsubstituted (C₁-C₁₂)alkoxy, and

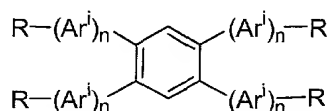
b) an aryl biradical selected from the group consisting of 1,4-naphthylene, 1,4-anthrylene, 9,10-anthrylene, 5,6,7,8-tetrahydronaphth-1,4-ylene, 9,9',10,10'-tetra(C₁-C₁₂)alkyl-9,10-dihydroanthr-1,4-ylene, 9,9'10,10'-tetraaryl-9,10-dihydroanthr-1,4-ylene, 9,9'10,10'-tetra(C₁-C₁₂)alkyl-9,10-dihydroanthr-2,6-ylene, 9,9'10,10'-tetraaryl-9,10-dihydroanthr-1,4-ylene.

16. A block copolymer of claim **15**, wherein Q¹, Q³ and Q⁵ are block para-phenylene subunits and Q², Q⁴ and Q⁶ are solubility enhancing subunits.

17. A block copolymer of claim **15**, wherein Q¹, Q³, Q⁵ and Q⁷ are solubility enhancing subunits and Q², Q⁴ and Q⁶ are block para-phenylene subunits.

18. A block copolymer of claim **15**, wherein each Arⁱ is selected from the group consisting of unsubstituted 1,4-phenylene and fluoro-substituted 1,4-phenylene .

19. A branched polymeric aromatic compound having the formula:



wherein

each R is a member selected from the group consisting of substituted or unsubstituted (C₁-C₁₂)alkyl, substituted or unsubstituted (C₁-C₁₂)alkoxy, phenyl and halogen;

the subscript n is an integer of from 3 to 8;

Ar is a substituted or unsubstituted aryl group and i is an integer denoting its position away from the central tetrasubstituted phenyl ring, and each Arⁱ can be the same or different from Ar^j at any other position;

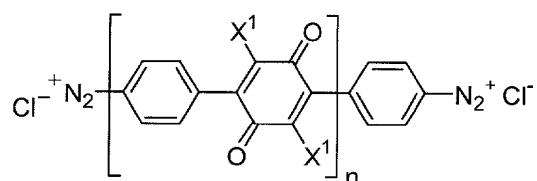
with the provisos that the Arⁱ groups are linked together in a 1,4-paraphenylene manner.

1 20. A branched polymeric aromatic compound of claim 19, wherein the
2 subscript n is 3; each Ar¹ and each Ar³ is 1,4-phenylene; and each Ar² is a substituted or
3 unsubstituted 1,4-phenylene.

1 21. A method of preparing a polymeric OLED material on a solid support,
2 said method comprising:

3 (a) contacting a solid support-bound aryl diazonium salt with 3,6-
4 dichloroquinone under conditions sufficient to form a solid support-bound aryl quinone
5 derivative; and

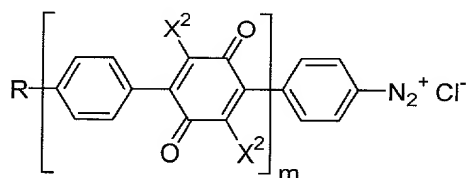
6 (b) contacting said solid support-bound aryl quinone derivative with a
7 diazonium compound having the formula:



8
9 wherein each X¹ is a blocking group and the subscript n is an integer of from 0 to 4;
10 under conditions sufficient to form an intermediate poly OLED material;

11 (c) repeating steps (a) and (b) from 2 to 70 times; and

12 (d) terminating the polymeric OLED material by contacting the product of
13 step (c) with a terminating diazonium compound having the formula:



14
15 wherein

16 each X² is a blocking group,

17 R is a member selected from the group consisting of H, substituted or unsubstituted

18 (C₁-C₁₂)alkyl, substituted or unsubstituted (C₁-C₁₂)alkoxy, substituted or

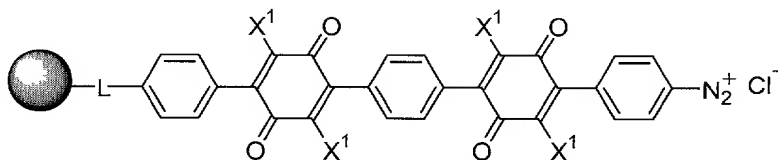
19 unsubstituted (C₁-C₁₂)alkylamino, substituted or unsubstituted (C₁-

20 C₁₂)alkylthio, substituted or unsubstituted di(C₁-C₁₂)alkylamino, substituted or

21 unsubstituted arylamino and substituted or unsubstituted diarylamino; and

22 m is an integer of from 0 to 3.

1 **22.** A method in accordance with claim **21**, wherein an intermediate poly
2 OLED material is produced having the formula:



3
4 wherein

5 L is a linking group;

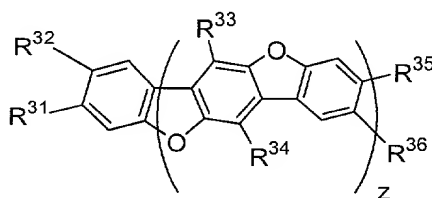
6 the shaded sphere is a solid support; and

7 X¹ is a member selected from the group consisting of halogen, substituted or
8 unsubstituted alkyl, substituted or unsubstituted alkoxy, substituted or
9 unsubstituted alkylamino, substituted or unsubstituted alkylthio, and
10 substituted or unsubstituted dialkylamino.

1 **23.** A method in accordance with claim **21**, wherein said solid support is
2 selected from the group consisting of glass, tin oxide, indium oxide, and mixtures thereof.

1 **24.** A solid support-bound poly OLED material formed by the method of
2 claim **21**.

1 **25.** A polyfurano ladder oligomer having the formula:



2
3 wherein

4 the subscript z is an integer of from 2 to 7;

5 each of R³¹, R³², R³³, R³⁴, R³⁵, R³⁶ is independently selected from the group consisting
6 of H, substituted or unsubstituted (C₁-C₁₂)alkyl, substituted or unsubstituted
7 (C₁-C₁₂)alkoxy and halogen.

1 **26.** A polyfurano ladder oligomer of claim **25**, wherein R³² and R³⁵ are
2 each H.

1 **27.** A polyfurano ladder oligomer of claim **25**, wherein z is an integer of
2 from 2 to 4; and R³² and R³⁵ are each H.

1 **28.** A method of forming a light emitting polymer, said method comprising
2 exposing an oligomeric para-phenylene compound of claim 1 having attached acrylate ester
3 groups to sufficient ultraviolet light to form a light emitting polymer comprising a plurality of
4 said oligomeric para-phenylene compound covalently attached to each other via ester and
5 ether linkages.

1 **29.** A method of forming a light emitting polymer, said method comprising
2 exposing a polyfurano ladder oligomer of claim **25** having attached acrylate ester groups to
3 sufficient ultraviolet light to form a light emitting polymer comprising a plurality of said
4 polyfurano ladder oligomers covalently attached to each other via ester and ether linkages